

ABSTRACTS OF RECENT PUBLICATIONS OF THE PROFESSIONAL STAFF OF THE HENRY FORD HOSPITAL AND THE EDESEL B. FORD INSTITUTE FOR MEDICAL RESEARCH

*REGULATION OF CHOLESTEROL MOBILIZATION IN MICE BY BILE ACIDS. W. T. BEHER, W. L. ANTHONY AND G. D. BAKER. *Proc. Soc. Exper. Biol. & Med.* 103:531, 1960.

The effects of cholic and hyodeoxycholic acids on mouse liver and carcass cholesterol mobilization were investigated. Cholic acid inhibited liver cholesterol mobilization, while hyodeoxycholic acid promoted a rapid elimination of accumulated liver cholesterol. Hyodeoxycholic acid reversed the inhibition caused by cholic acid. Neither of these substances effected the rate of carcass cholesterol mobilization.

THE PLACE OF TOTAL THYROIDECTOMY IN SURGERY FOR THYROID CARCINOMA. M. A. BLOCK, R. C. HORN AND B. E. BRUSH. *A.M.A. Arch. Surg.* 81:236, 1960.

In our experience, the over-all frequency of multicentricity in carcinoma of the thyroid is at least 13%. In a group of total or near total thyroidectomies, the figure was found to be at least 23%. These figures probably represent the minimal expression of the true incidence of this feature. The occurrence of multicentricity appears to justify total or near total thyroidectomy for most patients undergoing surgery to cure thyroid carcinoma. Evidence suggests this is especially true for patients under age 21 years. An anatomic dissection is required in performing total thyroidectomy to preserve parathyroid tissue on one side of the neck. If parathyroid tissue is not identified and preserved on the side of the neck opposite the primary or predominant lesion, it is usually preferable to leave a remnant of thyroid tissue in the region of the normal location of the parathyroid glands on this side of the neck. In a few patients, curative surgery requires sacrifice of all parathyroid tissue because of extensive bilateral carcinoma.

*EFFECT OF CORTICOTROPIN AND GROWTH HORMONE ON ALLANTOIN SYNTHESIS AND EXCRETION IN THE DOG. H. C. CHOITZ AND O. H. GAEBLER. *Proc. Soc. Exper. Biol. & Med.* 104:475, 1960.

Growth hormone increased the amount of ammonium citrate- N^{15} utilized for allantoin synthesis in dogs. Corticotropin did not have this effect. Neither hormone increased incorporation of N^{15} from glycine into allantoin. Corticotropin increased the output of urinary allantoin in dogs, without markedly reducing the specific enrichment with N^{15} in this excretory product. One possible interpretation of this finding is increased synthesis of allantoin, without qualitative changes in its origin.

FAMILIAL RECURRING POLYSEROSITIS. W. R. EYLER, R. K. NIXON AND R. J. PRIEST. *Am. J. Roentgenol.* 84:262, 1960.

In a patient of Armenian, Syrian or Jewish background who presents with an attack of pain which could be caused by inflammation of one of the serosal surfaces

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and, in particular, if he gives a history of recurrent attacks, familial recurring polyserositis should be considered. The radiologist can be of some assistance in making this diagnosis. Roentgenologic findings in familial recurring polyserositis are for the most part nonspecific, but are helpful in confirming a diagnosis. During attacks of abdominal pain, plain roentgenograms of the abdomen show small intestinal ileus and a barium meal study shows discontinuity of the column, dilatation and delay in transit. During attacks of pleural pain, basilar atelectasis is generally demonstrated and pleural fluid in small to moderate amounts is often found.

ILEORECTAL ANASTOMOSIS IN ULCERATIVE COLITIS. L. S. FALLIS AND J. BARRON. *A.M.A. Arch. Surg.* 81:444, 1960.

The necessity for removal of the entire colon in the surgical treatment of ulcerative colitis has been well established, and there is sufficient documentary evidence to suggest that the indications for subtotal colectomy are very limited. Success with the figure-of-9 loop type of anastomosis in the conversion of a Billroth II to a Billroth I type of operation has led us to apply this principle to the anastomosis between the ileum and the rectum. Rectal continence is of course a definite requirement, and operation should not be considered in patients with impaired sphincteric control. The loop type of ileorectal anastomosis has now been carried out in 26 cases, of which 20 were for ulcerative colitis and 6 for multiple polyposis. We have been agreeably surprised by the relatively good results which this procedure has yielded. Our experience confirms the opinion of Aylett and Turnbull that the operation is feasible and can be performed without unduly jeopardizing the patient's life. A long-term follow-up study will be necessary to determine whether or not these patients will have serious exacerbations in the remaining rectum to the point that their health and well-being are menaced, and, of course, the question of development of carcinoma in the rectal stump is one that must receive serious consideration.

TUMORS OF THE MINOR SALIVARY GLANDS. G. FINE, R. B. MARSHALL AND R. C. HORN, JR. *Cancer* 13:653, 1960.

The clinical and morphological features of 79 benign and malignant epithelial tumors of minor salivary glands of the oral cavity have been reviewed and compared to previously reported tumors. Classification, frequency, and distribution of our 42 cases of 718 cases of benign tumor from the literature are given. Histologic type, frequency and distribution of our 37 cases and of 348 cases of malignant tumors from the literature are presented. Attention has been called to differences and similarities between these and the major salivary gland epithelial tumors and the need for recognizing and segregating a group of cellular tumors (adenomas) from the malignant group.

*ON THE NATURE OF THE FLUORESCENCE OF ENZYME — DPNH COMPLEXES. H. F. FISHER AND L. L. MCGREGOR. *Biochem. Biophys. Acta.* 38:562, 1960.

The discovery that the addition of a DPNH-linked enzyme to a solution of DPNH causes an increase in the intensity of fluorescence and a shift of the emission spectrum to shorter wavelengths, has provided an elegant and versatile tool for the

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investigation of enzyme-coenzyme complexes. However, the usefulness of such studies has been sharply limited by the lack of any generally valid and experimentally substantiated explanation of the phenomenon. Hypotheses involving changes in the structure, conformation, planarity, or electron distribution of the reduced nicotinamide ring have been widely proposed. We have found, however, that the binding of DPNH in any manner which reduces the possibility of inter- or intra-molecular collisions will cause both an increase in fluorescence intensity and a shift of the emission spectrum to shorter wavelengths.

***THE MECHANISM OF THE GLUTAMIC DEHYDROGENASE REACTION. I. THE MOLECULARITY OF THE FIRST COMPLEX FORMED. H. F. FISHER.**
J. Biol. Chem. 235:1830, 1960.

The increase in the fluorescence of DPNH caused by the addition of glutamic dehydrogenase and the further enhancement of that increase by the reduced substrate of that enzyme have been reported and interpreted as evidence of complex formation. Similar phenomena have been described for other coenzyme I linked dehydrogenases, but in no case has proof been obtained directly relating the observed phenomena to complexes actually shown by kinetic evidence to be directly in the reaction sequence. This paper presents evidence that the observed fluorescence increase is in fact a direct measure of the active enzyme-reduced coenzyme complex, and assigns to that complex a definite position in the kinetically determined reaction sequence. The results of related experiments which provide direct support for that kinetically determined reaction sequence are described. The first step in the glutamic dehydrogenase reaction is the formation of a complex between the reduced coenzyme and the "active" site of the enzyme. The increase in the fluorescence of TPNH caused by addition of enzyme is a direct measure of the formation of that complex. α -Ketoglutarate cannot combine with the enzyme itself, but only with the enzyme-reduced coenzyme complex.

***THE ROLE OF ELECTRON MICROSCOPY IN THE DEVELOPMENT OF A NEW SCIENCE "CRYSTALLURGY". M. W. FREEMAN AND J. H. L. WATSON.**
Fourth International Conference on Electron Microscopy, 1958. Berlin, Springer-Verlag, 1960, v. 1, p. 472.

The new understanding of the electronic structure of metals and of the role of lattice imperfections in determining their physical properties have been centered primarily in concepts of the single crystal, i. e. the concept of regular arrays of metallic atoms in relatively simple lattices, with any deviations from regularity restricted to certain limited varieties, which in particular do not include imperfections of the grain boundaries. This improved understanding which is increasing dramatically from year to year supplies the foundation of crystallurgy. "Crystallurgy" is defined as the science of the working of, or with crystals. In particular it is the study of methods to combine into gross forms. It begins with an understanding of the single crystal and then builds polycrystalline materials which have predictable properties. If properties can be predicted it follows that they can be made optimum.

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*MAGNETISM IN MEDICINE. M. W. FREEMAN, A. ARROTT AND J. H. L. WATSON. J. Appl. Physics 31:404S, 1960.

The applications of magnetic materials and magnetic fields in medicine are reviewed. Direct biological effects of magnetic fields, clinical uses of the mechanical force exerted by magnets, and magnetic analysis as a tool in biochemistry are considered. The authors' applications of the technology of fine particle iron to the treatment of cancer and mental disease for investigation of basic biochemistry and for diagnostic purposes are discussed. A significant step in these applications has been the discovery of sublingual assimilation of fine particle iron.

REPEATED ASSOCIATION OF STAPHYLOCOCCAL ANTIBIOGRAMS AND PHAGE TYPES. J. E. GREER AND R. R. MENARD. Bact. Proc. 1960, p. 102.

In an epidemiological study of antibiograms (ABG) and phage types (PT) of nasal and cutaneous strains of *Staphylococcus aureus* from 150 dermatological patients, no ABG was always associated with any particular PT, and *vice versa*. Nevertheless, any particular ABG-PT combination occurring, generally remained the same in subsequent repeat cultures from the same or related patients. Usually a change in ABG was accompanied by a change in PT, and *vice versa*. The change in PT without change in ABG occurred rarely, indicating that phage typing of repeat cultures, in surveys on the same patient, need be done only if the ABG changes. The constancy of the antibiograms from the same sources was a valuable and necessary adjunct in strain identification when variability in phage patterns made strain relationships uncertain.

PREMATURE SEPARATION OF THE NORMALLY IMPLANTED PLACENTA. C. P. HODGKINSON AND J. NEUFELD. Clin. Obst. & Gynec. 3:585, 1960.

The term "premature separation of the normally implanted placenta" describes the basic pathology of the most common and most serious cause of uterine bleeding in mid and late pregnancy. Its management is discussed under terminology, statistics and etiology. Clinical experience suggests that there are two types of placental abruption, one mainly arterial associated with toxemia, nephritis, and essential hypertension, one mainly venous produced by compression of the venous return from the uterus. The pathology and treatment are reviewed emphasizing the immediate necessity of determining the severity of the disease, the state of coagulability of the blood and how soon the patient is likely to deliver.

PRIMARY ADENOCARCINOMA OF THE FEMALE URETHRA: A REVIEW AND REPORT OF 3 CASES. R. KNOBLICH. Am. J. Obst. & Gynec. 80:353, 1960.

The glands surrounding the female urethra are homologous to the cranial and ventral lobes of the male prostate. In experimental animals the "female prostate" can develop into comparatively large structures by injection of androsterone and its derivatives. Adenocarcinomas of the female urethra arise from these paraurethral glands. Forty-one cases were collected from the literature and 3 new cases added. The adenocarcinoma of the female urethra is almost exclusively a disease of menopausal or

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postmenopausal women. There does not seem to be any racial predilection or relationship between multiparity and the occurrence of these adenocarcinomas. The majority of adenocarcinomas involve the distal urethra. The onset is usually insidious, symptoms including hematuria, dysuria, blood discharge, incontinence and local pain. Urethral obstruction with retention and uremia occurs in 15 per cent of the patients. Metastases from adenocarcinomas of the female urethra are not infrequent. Most of the adenocarcinomas of the female urethra drain into the more superficial lymphatics of the vulva and thereby to the nodes of the inguinal region. In untreated patients death occurs within a couple of months. The most efficient treatment for this type of tumor seems to be local resection and radium or roentgen therapy to the tumor and the involved inguinal nodes. Involvement of the entire urethra and inguinal nodes metastases are poor prognostic signs. The experimental demonstration that the paraurethral glands respond to androgenic hormones by hypertrophy as does the male prostate suggests the possibility of supplementing surgical and radiation therapy by administration of estrogens.

EFFECT OF PROLONGED GRISEOFULVIN ADMINISTRATION ON LIVER, HEMATOPOIETIC SYSTEM, AND KIDNEY. C. S. LIVINGOOD, M. BRANNEN, R. L. ORDERS, J. B. KOPSTEIN AND J. W. REBUCK. A.M.A. Arch. Dermat. 81:760, 1960.

Griseofulvin was given to 66 patients with superficial fungus infections; patients were carefully observed for side-effects and possible toxicity. In adults, the dosage schedule was 250 mg. q.i.d. and in children 125 mg. or 250 mg. b.i.d. or t.i.d. depending on the age and weight of the patient. The only side-effects seen in our study were four cases of headaches, one of abdominal cramps, and one of slight insomnia. All of these manifestations disappeared while the patients were still under therapy. Griseofulvin appears to be an effective, safe, and relatively nontoxic antibiotic for the treatment of various types of superficial fungus infections. If future findings confirm the earlier studies, griseofulvin will prove to be one of the significant advances in dermatology.

***THE APPLICATION OF X-RAY DIFFRACTION TO MEDICAL PROBLEMS.** J. PARSONS. In Mueller, W. M., ed.: *Advances in X-ray Analysis*; Proc. of the Eighth Annual Conference on the Applications of X-ray Analysis, 1959, New York, Plenum Press, 1960, v. 3, p. 349.

The use of the x-ray diffraction Debye-Scherrer powder technique for the identification of crystalline material often found in pathologic tissue is discussed. Cases cited include: heart calcification, lung silicosis, thorium dioxide in liver and spleen, and granulomas of the skin and pericardium. The routine analysis of kidney stones using powder cameras as well as an x-ray diffractometer are described.

SKIN WINDOWS AND THE ACTION OF THE RETICULOENDOTHELIAL SYSTEM IN MAN. J. W. REBUCK, C. B. BOYD, AND J. M. RIDDLE. Ann. New York Acad. Sc. 88:30, 1960.

Aschoff, in his extension of Metchnikoff's general defense system of cells, included only those cells that were found to have an affinity for vital dyes. Since his methods were applied to the study of such a system of phagocytes in laboratory animals,

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we modified his method for study of those cells phagocytic for the same vital dyes (pyrrol blue, lithium carmine, trypan blue, and trypan red) in skin windows in man. In such inflammatory lesions lymphocytes, hypertrophied lymphocytes, macrophages, and monocytes all showed an ability to store the above-listed vital dyes. Recently Marshall claimed demarcation in sterile inflammatory exudates in rabbits between lymphocytes that could not be impregnated with silver and metalophil system of their fellow histiocytes or macrophages and monocytes. Applying his techniques to the progressive influx of mononuclears in human skin windows, lymphocytes were strongly metalophilic at 9 and 12 hours of inflammation in man, and hypertrophied lymphocytes were similarly metalophilic at 14 hours of inflammation. The importance of the granulocytic interrelationships with proper RES functions in these lesions was emphasized by correlation of low neutrophilic participation with low lymphocytic responses and increased basophilic leukocytic migrations with impaired mononuclear defenses.

FILM: STAPEDECTOMY AND GRAFT-PROSTHESIS OPERATION. H. F. SCHUKNECHT. *Acta oto-laryng.* 51:241, 1960.

Because the stapes mobilization procedure so frequently fails as a result of reankylosis of the footplate after a period of months or years, there has been a trend towards stapes replacement surgery.

Since 1956 I have used tantalum and stainless steel wire for partial stapes replacement, but in these cases the footplate was left intact. After several months it became obvious that the footplate reankylosed in many of these operations and it was necessary to remove it completely. Because an experiment performed in our laboratory demonstrated that tantalum wire was well tolerated in the middle ear for a period of months, we continued to use tantalum (and sometimes stainless steel) and devised a complete stapes replacement operation. The tantalum or stainless steel wire (.005 inches) is knotted around a fat or connective tissue graft of appropriate size. The opposite end of the wire prosthesis is fashioned into a buttonhook shape. The entire prosthesis is about 4½ mm. long. This is introduced so that the soft tissue lies within the oval window and the buttonhook is firmly attached to the incus.

Although it is too early to evaluate the results, it is quite obvious that the incidence of excellent hearing maintained over a period of months is much greater than with any previous procedure used in our hands.

FUNCTIONAL ALTERATIONS FROM SENSORY-NEURAL LESIONS. H. F. SCHUKNECHT. In, Jackson, C., and Jackson, C. L., eds.: *Diseases of the Nose, Throat, and Ear*, ed. 2, Philadelphia, Saunders, 1959, pp. 383-395.

Loudness recruitment is characteristically present in Meniere's disease and stimulation deafness and other disorders which primarily involve the organ of Corti. Simply stated, it means that with increase in stimulus intensity there is an abnormally rapid rise in loudness sensation, so that even though there is a threshold loss, loudness sensation at high stimulus intensities will approximate or equal that of a normal ear. A reasonable explanation follows: The neurophysiologic correlate of loudness is thought to be the total number of impulses transmitted in the acoustic nerve fibers per unit period of time, the variables being the number of nerve fibers involved and the frequency

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of the impulses in these nerve fibers. The two requirements for loudness recruitment, therefore, seem to be (1) a normal or near-normal nerve fiber population and (2) a damaged organ of Corti having a hair cell population which is diminished enough to account for a threshold loss but adequate enough to excite normal numbers of nerve fibers at high stimulus intensities. The manner by which residual inner hair cells in a pathologically affected ear activate large numbers of nerve fibers is not entirely clear. It is known that a great number of peripheral nerve fibers have their endings only on external hair cells. One explanation may be that the electric potentials developed by the remaining hair cells become sufficiently large and strong at the high stimulus intensities to activate nerve fibers which pass near the cells. It is known also that the ear manifesting loudness recruitment is better able to detect small changes in stimulus intensity, a phenomenon known as the "decreased intensity difference limen". This is logical enough for it seems obvious that unit changes in intensity occurring within the sensitivity range of such a diseased ear would affect more fibers and hence create greater changes in loudness sensation than in a normal ear. Therefore, loudness recruitment and decreased intensity difference limen appear to be manifestations of an incomplete sensory lesion with a normal or near-normal spiral ganglion.

On the other hand, with lesions involving the auditory neural pathways, e. g., acoustic neurinoma, and the neural atrophy type of presbycusis, the characteristic auditory manifestations are loss of ability to understand speech out of proportion to loss for pure tone thresholds. It appears that the auditory nerve fibers are important channels in a communication system. In recent years communication theory and concepts on information transmission have been expressed in precise, mathematical terms. Although few are interested in, or capable of understanding the mathematics involved, the fundamental concepts are simple. The ear analyzes speech by recoding the sound signals into nerve impulses which then travel along the auditory nerve. The fundamental coding method is very simple in that a nerve impulse is either present or absent. This principle of all or none is basic to neurophysiology. Another limitation is that a single nerve fiber can carry a maximum of only 800 to 1000 impulses per second. We can enumerate the variables in a neural pattern as follows: (1) the frequency of impulses in a single fiber, (2) the time relations between impulses in various fibers, (3) the selectivity as to which fibers are being activated, and (4) the number of fibers activated. In spite of the all-or-none law the normal auditory pathways can carry all the information required for intelligibility of the spoken voice. This is possible because of the tremendous number of channels in the communication system, because we know there are about 35,000 nerve fibers in the human auditory nerve. In the diseased ear with a loss of nerve fibers a limitation is imposed on the coding mechanism so that the amount of information which can be transmitted from the ear to the brain is less than normal. This deficiency in the number of nerve fibers results in an auditory system which can transmit simple signals (pure tones) of threshold magnitude, but cannot handle the complex signals of speech.

THE METAL PROSTHESIS FOR STAPES ANKYLOSIS. H. F. SCHUKNECHT AND S. OLEKSIUK. *A.M.A. Arch. Otolaryngol.* 71:287, 1960.

Early oval window surgery for the treatment of stapes ankylosis due to otosclerosis was of the indirect type in which attempts were made to mobilize the footplate by

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forces transmitted through the crura. Very often these procedures resulted in crural fracture and, for this reason, a direct footplate approach soon was advocated by many otologists. These direct attempts consisted of the use of chisels, pneumatic hammers, and picks of various types. The direct attack on the footplate resulted in higher success rates because the number of crural fractures was reduced, but in many cases the hearing was lost again because of reankylosis of the footplate. It became evident, therefore, that there were two unsolved problems in oval window surgery; accomplishing adequate mobilization while creating or maintaining a "columella effect", and avoiding reankylosis.

In an experiment on cats we have shown that footplate fractures heal by bony reunion when the fragments are closely approximated but a slight separation or gap is bridged by a membrane. We endeavor to make use of this particular healing process to prevent reankylosis for if part, or all, of the footplate could be displaced inward so as to be separated slightly from the otosclerosis lesion and/or the margins of the oval window, the gap would be bridged by a mucoendosteal membrane, creating thereby a permanently mobile segment of the footplate.

The surgical design which was developed as the result of the discovery of the mucoendosteal membrane consisted of the following steps: removal of the head, neck and crura of the stapes; mobilization of the thin normal, or nearly normal, portion of the footplate with fine chisels; replacement of the crura with a prosthesis of sufficient length to depress the mobilized portion of the footplate slightly from contact with the surrounding bone and/or annular ligament.

Between October, 1956 and January, 1959, 166 metal prostheses were introduced, of which 30 were tantalum and 136 of stainless steel. The average time lapse from operation to final audiogram was three months. The 30 db. level or better for the three speech frequencies was asquired by 142 (86%) patients. Twenty-two showed no change, and two had losses of 6 db. or more. The bone-air gap was closed 50% or more in 68% of the patients. These results are considerably superior to those achieved by methods we used previously.

We are convinced that oval window surgery is superior to fenestration surgery because it permits utilization of the transformer mechanism of the middle ear and avoids the problems resulting from exteriorization of the mastoid cavity. More time is required to evaluate the long term prognosis of this operative technique.

EXPERIMENTAL AORTIC ATHEROSCLEROSIS IN RABBITS FOLLOWING THE INGESTION OF DIHYDROCHOLESTEROL. J. C. SIERACKI, W. T. BEHER*, AND G. D. BAKER*. *Angiology* 11:343, 1960.

Ingested dihydrocholesterol, a constant companion of cholesterol, is atherogenic in rabbits. The atherosclerosis is different from that seen in cholesterol fed rabbits. The histologic sequence of events in these lesions over a 51-week period is described in some detail. The lesions occurred in the absence of a gross hyperlipemia or signi-

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ficant hypercholesterolemia. Chemical analysis of the blood suggest that the serum cholesterol is partially replaced by dihydrocholesterol during the course of the experiment.

COLON SPHINCTERS SIMULATING ORGANIC DISEASE. A. W. TEMPLETON. *Radiology* 75:237, 1960.

A brief review of colonic sphincters is given with attention to their location and probable source of origin. Five cases are presented in which organic colon disease, in particular, carcinoma at a sphincter site, was suspected on the initial barium enema study. Subsequent examinations in 4 cases and surgery in 1 failed to demonstrate any abnormality. The segments of narrowing must, in each instance, have been due to persistent spasm in the region of a colonic sphincter.

*EFFECTS OF MAGNETIC FIELDS UPON ANISOTROPIC IRON CRYSTALS. J. H. L. WATSON, A. ARROTT, AND M. W. FREEMAN. *J. Appl. Physics* 29:306, 1958.

Problems inherent to magnetic alignment of alpha iron crystals are discussed and explained by electron microscopic observation of the behavior of the single domain crystals under the effect of magnetic fields. With these specimens, which possess a fraction of magnetically unfavorable dendrites, intrinsic coercive forces of over 1700 oersteds have been measured without alignment.

*AN ELECTRON MICROSCOPICAL STUDY: SOME EFFECTS OF MAGNETIC FIELD UPON SINGLE, ANISOTROPIC ALPHA IRON CRYSTALS AND THE RELATION BETWEEN THEIR FINE STRUCTURE AND MAGNETIC PROPERTIES. J. H. L. WATSON AND M. W. FREEMAN. *Fourth International Conference on Electron Microscopy*, 1958. Berlin, Springer-Verlag, 1960, v. 1, p. 467.

From theoretical considerations several behaviour patterns were predicted, (1) it would be difficult to align any particle completely if there were counter-acting torques, and therefore it might be expected that many particles, even when completely isolated and ideally shaped, would not be in complete alignment with the field; (2) in a strongly dendritic particle there might be more torque active upon a set of its secondaries than upon the central stem itself and it would be expected therefore that such particles would frequently lie transversely to the field direction; (3) local dipole effects might be observed to interfere with the field effect and it would be expected that some free particles would take unaligned positions; (4) the torques might be sufficient to bend primary or secondary branches of particles held rigidly in one or more places; (5) rod-like particles would be expected to align more readily than well developed dendrites, and best alignment in samples containing both types of crystals would be found among rod-like particles. All of these observations predicted by theory were seen in the micrographs. From the general behaviour reported, it is not surprising that while separated small agglomerates can be aligned, if they bunch together in large streams before alignment it is impossible for the applied fields, no matter how large, to cause further alignment. From these studies it is reported again that minimum of secondary development. In addition the medium in which they are placed

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should offer some ideal impedance to allow particle rotation but to reduce the streaming effect which for this medium to do just this, and to fulfill this impedance requirement. At the same time it allows determination of the magnetic properties on a block which can be sectioned later to give direct correlation between magnetic results and particle alignment.

*AN ELECTRON MICROSCOPICAL STUDY: THE STRUCTURE AND MORPHOLOGY OF ULTRAMICROSCOPIC DENDRITES OF ALPHA IRON. J. H. L. WATSON. Fourth International Conference on Electron Microscopy, 1958. Berlin, Springer-Verlag, 1960, v. 1, p. 464.

Three papers describe the role of electron microscopy in the determination of certain properties of ultramicroscopic crystals of alpha iron and in the assessment of their uses. The crystals are produced in a unique process of controlled electrolysis under conditions which favor the deposition of single particles in discrete locations rather than in continuous plated layers. All of the crystals to be described are inherently dendritic regardless of their specific morphology. In addition, we have reason to believe that they are monolithic and of the same nature as "whiskers", except for their greatly reduced dimensions. Although the dendrites were examined extensively by the more usual electron microscopical methods, it was not until carbon replication with partial etching was applied to them, coupled with stereoscopy, that a structure was determined which was consistent with certain chemical kinetics of the reaction, as well as with the crystal structure itself of this body-centered, cubic material.

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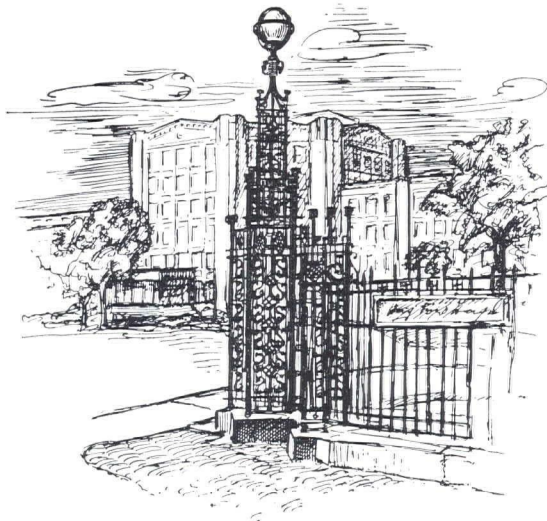
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